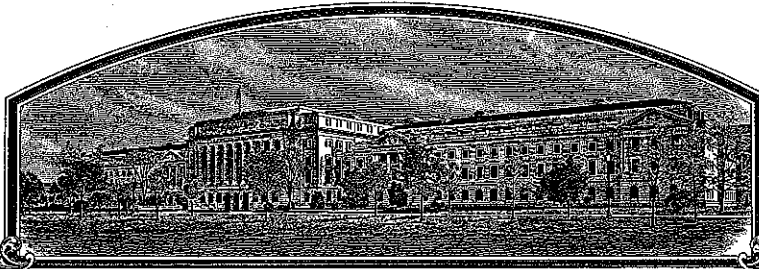


No.

200400011



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Shamrock Seed Company, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

LETTUCE

'Colossus'



In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this sixth day of September, in the year two thousand and six.

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER Shamrock Seed Company, Inc.		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME SSC 30376		3. VARIETY NAME Colossus (cleared)	
4. ADDRESS <i>(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)</i> 3 Harris Place Salinas, CA 93901 USA		5. TELEPHONE <i>(include area code)</i> (831) 771-1500		FOR OFFICIAL USE ONLY PVPO NUMBER <div style="font-size: 2em; font-weight: bold;">2004 00 011</div> FILING DATE <div style="font-size: 1.5em;">October 14, 2003</div>	
6. FAX <i>(include area code)</i> (831) 771-1517		7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION <i>(corporation, partnership, association, etc.)</i> Corporation			
8. IF INCORPORATED, GIVE STATE OF INCORPORATION CA		9. DATE OF INCORPORATION January 1, 1983		FILING AND EXAMINATION FEES: \$ 3652.00 DATE 10/14/2003 CERTIFICATION FEE: \$ 768.00 DATE 6/26/06	
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. <i>(First person listed will receive all papers)</i> Larry D. Knerr, Ph.D. Shamrock Seed Co., Inc 3 Harris Place Salinas, CA 93901 USA					
11. TELEPHONE <i>(include area code)</i> (831) 771-1500	12. FAX <i>(include area code)</i> (831) 771-1517	13. E-MAIL lknerr@shamrockseed.com			
14. CROP KIND <i>(Common Name)</i> Lettuce	16. FAMILY NAME <i>(Botanical)</i> Asteraceae	18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (OPTIONAL) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION.			
15. GENUS AND SPECIES NAME OF CROP Lactuca sativa	17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? <i>(See Section 83(a) of the Plant Variety Protection Act)</i> <input type="checkbox"/> YES <i>(If "yes", answer items 21 and 22 below)</i> <input checked="" type="checkbox"/> NO <i>(If "no", go to item 23)</i>			
19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED <i>(Follow instructions on reverse)</i> a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input type="checkbox"/> Exhibit D. Additional Description of the Variety <i>(Optional)</i> e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Voucher Sample <i>(2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository)</i> g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$3,652), made payable to "Treasurer of the United States" <i>(Mail to the Plant Variety Protection Office)</i>		21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, WHICH CLASSES? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED			
23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. <i>(Please use space indicated on reverse.)</i>		22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS. <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED <i>(If additional explanation is necessary, please use the space indicated on the reverse.)</i>			
24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. <i>(Please use space indicated on reverse.)</i>		25. The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF OWNER 		SIGNATURE OF OWNER Larry D. Knerr			
NAME <i>(Please print or type)</i> Larry D. Knerr		NAME <i>(Please print or type)</i> Larry D. Knerr			
CAPACITY OR TITLE Research Director	DATE 09/18/2003	CAPACITY OR TITLE Research Director	DATE 09/18/2003		

(See reverse for instructions and information collection burden statement)

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), **ALL** of the following items must be **received** in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to **reproduce** the variety, or for tuber reproduced varieties verification that a viable (*in the sense that it will reproduce an entire plant*) tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for \$3,652 (\$432 filing fee and \$3,220 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfilled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. **Retain one copy for your files.** All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$432 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

Homepage: <http://www.ams.usda.gov/science/pvpo/pvp.htm>

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority and provide evidence that name has been cleared by the appropriate recognized authority before the Certificate of Protection is issued. For example, for agricultural and vegetable crops, contact: Seed Branch, AMS, USDA, 10301 Baltimore Avenue, Suite 401 NAL Building, Beltsville, MD 20705. Telephone: (301) 504-5682 <http://www.ams.usda.gov/lsg/seed.htm>.

ITEM

- 19a. Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
(2) the details of subsequent stages of selection and multiplication;
(3) evidence of uniformity and stability; and
(4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 19b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
(1) identify these varieties and state all differences objectively;
(2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
(3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 19c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 19d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 19e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
20. If "Yes" is specified (*seed of this variety be sold by variety name only, as a class of certified seed*), the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
23. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
24. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.

22. CONTINUED FROM FRONT (Please provide a statement as to the limitation and sequence of generations that may be certified.)

23. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

Oct 15, 2002 Dec. 6, 2002 RAO 5/26/2006

24. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. The fees for filing a change of address; owner's representative; ownership or assignment; or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 1.4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, sexual orientation, marital or family status, political beliefs, parental status, or protected genetic information. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

PVP Application, Vanguard Group Lettuce (*Lactuca sativa*) 'Colossus'

EXHIBIT A

Origin and Breeding History of the Variety

'Colossus' was developed from an original cross, made in 1994. The female parent in this cross is the variety 'Del Rey'. The male parent in this cross is the variety 'Winterhaven'. Through pedigree selection for plant type and field screening for tolerance to Lettuce Big Vein (LBV), a stable and uniform F5 line with LBV tolerance was selected in 1998 that was used as stock seed to produce 'Colossus'. Each generation of selection was carried out in Yuma, Arizona. Selection criteria included, head shape, head size, head weight, heading ability, frame size, and LBV reaction. 'Colossus' has been reproduced and judged stable and uniform for four generations (1998 through 2001) of seed increase. 'Colossus' is uniform for all traits as described in Exhibit C and shows no variants or naturally occurring off-types. The pedigree, using notation adhered to by Shamrock Seed Company, for 'Colossus' is noted below.

[Del Rey x Winterhaven]-B1B2(Bulk)

PVP Application, Vanguard Group Lettuce (*Lactuca sativa*) 'Colossus'

EXHIBIT B

Statement of Distinctness

'Colossus' is most similar to the variety 'Coyote'. The most widely grown, similar variety in the same planting slot as 'Colossus' is 'Winterhaven'. 'Colossus' has the same leaf color as 'Coyote' and a darker leaf color than 'Winterhaven'. 'Colossus' is earlier to mature and has a higher head weight than either 'Coyote' or 'Winterhaven'. The following table demonstrates the differences among these varieties:

Variety	Days to Maturity*	Color at Maturity**	Head Weight at Maturity***
Colossus	99.50	143C	718 g
Coyote	103.25	143C	596 g
Winterhaven	106.00	143D	604 g

*Average of 4 trials, fall and winter growing seasons, Southwest, USA

**As determined by RHS color chart.

***average weight of 96 heads, see attachment

PVP Application, Vanguard Group Lettuce (*Lactuca sativa*) 'Colossus'

EXHIBIT B, Attachment

Statement of Distinctness

Head Weight at Maturity (grams)

Trial 1, Winterhaven, CA, planting date 9/27/01

Variety	N	Mean	SD	LSD(0.05)
Colossus	24	761.3	46.79	55.6
Coyote	24	615.1	63.29	
Winterhaven	24	626.5	64.20	

Trial 2, Yuma, AZ, planting date 10/16/01

Colossus	24	677.5	44.33	34.8
Coyote	24	596.1	49.85	
Winterhaven	24	641.8	39.18	

Trial 3, Yuma, AZ, planting date 9/28/02

Colossus	24	701.2	48.62	39.3
Coyote	24	631.0	56.10	
Winterhaven	24	650.3	62.52	

Trial 4, Holtville, CA, planting date 11/9/02

Colossus	24	731.3	44.46	73.2
Coyote	24	542.0	66.45	
Winterhaven	24	497.2	54.83	

PVP Application, Vanguard Group Lettuce (*Lactuca sativa*) 'Colossus'

EXHIBIT B, Attachment

Statement of Distinctness

Raw Data, Mature Head Weight (grams)

Trial 1

Trial 2

Colossus	Coyote	Winterhaven	Colossus	Coyote	Winterhaven
744	433	711	703	652	711
813	615	644	690	539	659
767	692	600	644	479	690
718	654	593	663	581	602
778	590	656	614	631	643
692	563	619	677	605	592
770	622	577	588	577	619
756	633	704	705	573	577
752	659	633	688	614	633
797	581	537	712	653	711
804	590	623	673	598	658
739	644	607	702	640	572
815	627	584	733	611	652
744	611	718	687	636	640
760	598	593	713	489	650
766	753	575	714	573	632
735	623	691	644	657	591
783	603	509	597	631	654
622	510	560	699	570	611
750	606	763	744	565	639
862	687	648	652	657	689
781	576	624	600	622	630
795	690	555	682	534	655
729	602	711	736	619	693

PVP Application, Vanguard Group Lettuce (*Lactuca sativa*) 'Colossus'

EXHIBIT B, Attachment

Statement of Distinctness

Raw Data, Mature Head Weight (grams)

Trial 3

Trial 4

Colossus	Coyote	Winterhaven	Colossus	Coyote	Winterhaven
752	642	610	670	635	521
704	620	706	800	500	555
688	671	593	690	508	496
714	715	659	685	608	431
632	563	567	810	444	522
709	592	677	742	501	588
644	628	604	705	498	502
622	660	607	698	635	477
710	600	574	802	511	544
745	648	652	711	477	403
722	647	625	780	610	457
656	601	622	692	475	533
719	745	615	720	426	509
707	633	602	715	603	465
714	549	714	777	575	414
693	662	586	744	595	511
732	606	762	692	450	413
702	710	797	727	520	422
694	552	650	716	605	602
590	687	712	736	622	488
755	520	590	680	604	570
766	578	688	722	490	511
800	641	653	822	527	498
659	675	741	714	590	500

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**U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705**

EXHIBIT C
(Lettuce)

**OBJECTIVE DESCRIPTION OF VARIETY
LETTUCE (*Lactuca sativa* L.)**

NAME OF APPLICANT(S) Shamrock Seed Co., Inc.	FOR OFFICIAL USE ONLY
ADDRESS (Street and No. or RD No., City, State, and ZIP Code) 3 Harris Place Salinas, CA 93901 USA	PVPO NUMBER 2004 00 011
	VARIETY NAME
	EXPERIMENTAL DESIGNATION

Place the appropriate number that describes the varietal character in the boxes below. Place a zero in the first box (eg. or) when number is either 99 or less or 9 or less. Measured data should be the mean of an appropriate number (at least 20) of well spaced plants. Royal Horticultural Society or any recognized color standard may be used to determine plant colors.

The location of the test area is: Gilroy, CA (West Coast)

Color System Used: RHS Color Chart

SPECIFIC VARIETIES USED FOR COMPARISON AS CHECK VARIETIES IN THIS APPLICATION: Use standard regional check varieties which are adapted to your area. One of the comparison varieties must be the most similar variety used in Exhibit B.

Application Variety (a1.) Colossus Most Similar Variety (c1.) Coyote

Standard Regional Check Variety (c2.) Winterhaven

1. PLANT TYPE: (See list of suggested check varieties page 4.)

01= Cutting/Leaf	04= Cos or Romaine	07= Salinas Group	10= Latin
02= Butterhead	05= Great Lakes Group	08= Eastern (Ithaca) Group	11= OTHER (Specify below):
03= Bibb	06= Vanguard Group	09= Stem	

(a1.) (c1.) (c2.)

2. SEED:

(a1.) <input type="text" value="2"/>	COLOR	(a1.) <input type="text" value="2"/>	LIGHT DORMANCY	(a1.) <input type="text" value="2"/>	HEAT DORMANCY
(c1.) <input type="text" value="2"/>	1= White (Silver Grey)	(c1.) <input type="text" value="2"/>	1= Light Required	(c1.) <input type="text" value="2"/>	1= Susceptible
(c2.) <input type="text" value="2"/>	2= Black (Grey Brown)	(c2.) <input type="text" value="2"/>	2= Light Not Required	(c2.) <input type="text" value="2"/>	2= Not Susceptible
	3= Brown (Amber)				

3. COTYLEDON TO FOURTH LEAF STAGE: NOTE: Provide a color photograph or photocopy of the fourth leaf from 20 day old seedling grown under optimal conditions.

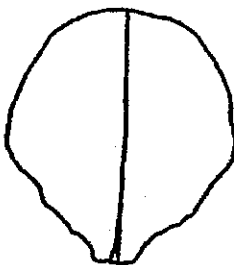
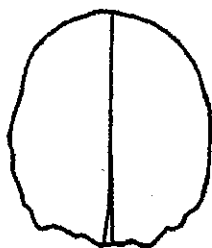
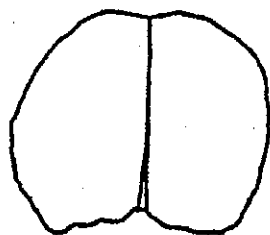
SHAPE OF COTYLEDONS: 1=Broad 2= Intermediate 3= Spatulate

(a1.) (c1.) (c2.)

3. Cotyledon to Fourth Leaf Stage (Continued)

2004 00 011

SHAPE OF FOURTH LEAF:

(a1.) (c1.) (c2.) 

1.

2.

3.

4.

5.

6.

LENGTH/WIDTH INDEX OF FOURTH LEAF: L/W x 10

(a1.) (c1.) (c2.)

APICAL MARGIN:

1= Entire

2= Crenate/Gnawed

3= Finely Dentate

4= Moderately Dentate

5= Coarsely Dentate

6= Incised

7= Lobed

8= OTHER (Specify below):

(a1.) (c1.) (c2.)

BASAL MARGIN:

(Use the options for Apical Margin above)

(a1.) (c1.) (c2.)

UNDULATION:

1= Flat

2= Slight

3= Medium

4= Marked

(a1.) (c1.) (c2.)

GREEN COLOR:

1= Yellow Green

2= Light green

3= Medium Green

4= Dark Green

5= Blue Green

6= Silver Green

7= Grey Green

(a1.) (c1.) (c2.)

ANTHOCYANIN:

DISTRIBUTION:

1= Absent

2= Margin Only

3= Spotted

4= Throughout

5= OTHER (Specify below):

(a1.) (c1.) (c2.)

CONCENTRATION:

1= Light

2= Moderate

3= Intense

(a1.) (c1.) (c2.)

9

3. Cotyledon to Fourth Leaf Stage (Continued)

ROLLING: 1= Absent 2= Present

(a1.) (c1.) (c2.)

CUPPING: 1= Uncupped 2= Slight 3= Markedly

(a1.) (c1.) (c2.)

REFLEXING: 1= None 2= Apical Margin 3= Lateral Margins

(a1.) (c1.) (c2.)

4. MATURE LEAVES (Observe Harvest-Mature Outer Leaves)

NOTE: Provide color photo of a harvest-mature leaf which accurately shows color and margin characteristics.

MARGIN:

INCISION DEPTH: 1=Absent/Shallow (Dark Green Boston) 2= Moderate (Vanguard)
(deepest penetration of the margin)
3= Deep (Great Lakes 659)

(a1.) (c1.) (c2.)

INDENTATION: 1= Entire (Dark Green Boston) 4= Crenate (Vanguard)
(finest divisions of the margin) 2= Shallowly Dentate (Great Lakes 65) 5= OTHER (Specify):
3= Deeply Dentate (Great Lakes 659)

(a1.) (c1.) (c2.)

UNDULATIONS OF THE APICAL MARGIN: 1= Absent/ Slight (Dark Green Boston) 2= Moderate (Vanguard)
3= Strong (Great Lakes 659)

(a1.) (c1.) (c2.)

GREEN COLOR: 1=Very Light Green (Bibb) 3= Medium Green (Great Lakes) 5= Very Dark Green
2= Light green (Minetto) 4= Dark Green (Vanguard) 6= OTHER (Specify):

(a1.) (c1.) (c2.)

ANTHOCYANIN:

DISTRIBUTION: 1=Absent 3= Spotted (Calif. Cream Butter) 5= OTHER (Specify below):
2= Margin Only (Big Boston) 4= Throughout (Prize Head)

(a1.) (c1.) (c2.)

CONCENTRATION: 1= Light (Iceberg) 2= Moderate (Prize Head) 3= Intense (Ruby)

(a1.) (c1.) (c2.)

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4. Mature Leaves (Continued)

SIZE:

1= Small

2= Medium

3= Large

(a1.) 2

(c1.) 3

(c2.) 2

GLOSSINESS:

1= Dull (Vanguard)

2= Moderate (Salinas)

3= Glossy (Great Lakes)

(a1.) 2

(c1.) 2

(c2.) 1

BLISTERING:

1= Absent/Slight
(Salinas)2= Moderate
(Vanguard)3= Strong
(Prize Head)

(a1.) 2

(c1.) 2

(c2.) 2

LEAF THICKNESS:

1= Thin

2= Intermediate

3= Thick

(a1.) 3

(c1.) 3

(c2.) 3

TRICHOMES:

1= Absent (Smooth)

2= Present (Spiny)

(a1.) 1

(c1.) 1

(c2.) 2

5. PLANT

SPREAD OF FRAME LEAVES:

(a1.) 4 1 cm

(c1.) 4 8 cm

(c2.) 3 8 cm

HEAD DIAMETER: (market trimmed with single cap leaf)

(a1.) 1 8 cm

(c1.) 1 9 cm

(c2.) 1 7 cm

HEAD SHAPE :

1= Flattened

2= Slightly Flattened

3= Spherical

4= Elongate

5= Non-Heading

6= OTHER (Specify): _____

(a1.) 2

(c1.) 2

(c2.) 2

HEAD SIZE CLASS:

1= Small

2= Medium

3= Large

(a1.) 3

(c1.) 3

(c2.) 3

HEAD PER CARTON:

(a1.) 2 4

(c1.) 2 4

(c2.) 2 4

HEAD WEIGHT:

(a1.) 0 7 2 4 g

(c1.) 0 6 1 0 g

(c2.) 0 6 2 1 g

HEAD FIRMNESS :

1= Loose

2= Moderate

3= Firm

4= Very Firm

(a1.) 3

(c1.) 3

(c2.) 3

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6. BUTT

SHAPE:

1= Slightly Concave

2= Flat

3= Rounded

(a1.) 2

(c1.) 2

(c2.) 1

MIDRIB:

1= Flattened (Salinas)

2= Moderately Raised

3= Prominently Raised (Great Lakes 659)

(a1.) 2

(c1.) 2

(c2.) 2

7. CORE

DIAMETER AT BASE OF HEAD:

(a1.) 5 1 mm

(c1.) 5 1 mm

(c2.) 4 9 mm

RATIO OF HEAD DIAMETER/CORE DIAMETER:

(a1.) 0 3 5

(c1.) 0 3 7

(c2.) 0 3 4

CORE HEIGHT FROM BASE OF HEAD TO APEX:

(a1.) 5 1 mm

(c1.) 4 4 mm

(c2.) 5 1 mm

8. BOLTING (Give First Water Date: 3/14/03)

NOTE: First Water Date is the date seed first receives adequate moisture to germinate. This can and often does equal the planting date.

NUMBER OF DAYS FROM FIRST WATER DATE TO SEED STALK EMERGENCE (summer conditions):

(a1.) 0 9 6

(c1.) 0 9 4

(c2.) 0 9 6

BOLTING CLASS:

1= Very Slow

2= Slow

3= Medium

4= Rapid

5= Very Rapid

(a1.) 2

(c1.) 2

(c2.) 2

HEIGHT OF MATURE SEED STALK:

(a1.) 0 9 7 cm

(c1.) 0 9 3 cm

(c2.) 0 8 0 cm

SPREAD OF BOLTER PLANT: (at widest point)

(a1.) 3 3 cm

(c1.) 3 2 cm

(c2.) 3 0 cm

BOLTER LEAVES:

1= Straight

2= Curved

(a1.) 2

(c1.) 2

(c2.) 2

MARGIN:

1= Entire

2= Dentate

(a1.) 2

(c1.) 2

(c2.) 2

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8. Bolting (Continued)

COLOR:

1= Light Green

2= Medium Green

3= Dark Green

(a1.) (c1.) (c2.)

BOLTER HABIT:

TERMINAL INFLORESCENCE:

1= Absent

2= Present

(a1.) (c1.) (c2.)

LATERAL SHOOTS:

1= Absent

2= Present

(a1.) (c1.) (c2.)

BASAL SIDE SHOOTS:

1= Absent

2= Present

(a1.) (c1.) (c2.)

9. MATURITY

(earliness of harvest-mature head formation)

NOTE: Complete this section for at least one season.

SEASON	APPLICATION VARIETY no. of days ¹			MOST SIMILAR VARIETY no. of days ¹			STANDARD REGIONAL CHECK VARIETY no. of days ¹		
Spring									
Summer	78			80			86		
Fall	90	92		93	97		96	99	
Winter	110	106		114	109		118	111	

Give planting date(s) and location(s):

Spring:

Summer: 3/14/03, Gilroy, CA (West Coast)

Fall: 9/27/01, Winterhaven, CA (Southwest); 9/28/02, Yuma, AZ (Southwest)

Winter: 10/16/01, Yuma, AZ (Southwest); 11/9/02, Holtville, CA (Southwest)

1. First Water Date to Harvest

10. ADAPTATION:

PRIMARY REGIONS OF ADAPTATION (tested and proven adapted):

(0= Not Tested

1= Not Adapted

2= Adapted)

Southwest (CA and/or AZ desert)

West Coast

Northeast

North-central

Southeast

OTHER (Specify): _____

SEASON:

<input type="text" value="0"/>	Spring	(Area _____)	<input type="text" value="2"/>	Fall	(Area Southwest _____)
<input type="text" value="1"/>	Summer	(Area West Coast _____)	<input type="text" value="2"/>	Winter	(Area Southwest _____)

<input type="text" value="0"/>	GREENHOUSE:	0= Not Tested	1= Not Adapted	2= Adapted
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<input type="text" value="1"/>	SOIL TYPE:	1= Mineral	2= Organic	3= Both
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11. VIRAL DISEASES

1= Immune

3= Resistant

5= Moderately Resistant/Moderately Susceptible 7= Susceptible

9= Highly Susceptible

Big Vein	(a1.)	5	(c1.)	7	(c2.)	9
Lettuce Mosaic	(a1.)	7	(c1.)		(c2.)	
Cucumber Mosaic	(a1.)		(c1.)		(c2.)	
Tomato Bushy Stunt, cause of dieback	(a1.)	3	(c1.)	3	(c2.)	3
Turnip Mosaic	(a1.)		(c1.)		(c2.)	
Beet Western Yellows	(a1.)		(c1.)		(c2.)	
Lettuce Infectious Yellows	(a1.)		(c1.)		(c2.)	
OTHER (Specify): _____	(a1.)		(c1.)		(c2.)	

12. FUNGAL/BACTERIAL DISEASES

1= Immune

3= Resistant

5= Moderately Resistant/Moderately Susceptible 7= Susceptible

9= Highly Susceptible

Corky Root Rot	(a1.)	7	(c1.)	7	(c2.)	7
(Races: _____)						
Downy Mildew	(a1.)	7	(c1.)	7	(c2.)	7
(Races: CA V, VI, VII, VIII)						
Powdery Mildew	(a1.)		(c1.)		(c2.)	
Sclerotinia Drop	(a1.)	7	(c1.)	7	(c2.)	7
Bacterial Soft Rot (<i>Pseudomonas</i> spp. and others)	(a1.)		(c1.)		(c2.)	
Botrytis (Grey Mold)	(a1.)		(c1.)		(c2.)	
Verticillium Wilt	(a1.)		(c1.)		(c2.)	
Bacterial Leaf Spot	(a1.)		(c1.)		(c2.)	
Anthracnose	(a1.)		(c1.)		(c2.)	
OTHER (Specify): _____	(a1.)		(c1.)		(c2.)	

13. INSECTS

1= Immune

3= Resistant

5= Moderately Resistant/Moderately Susceptible 7= Susceptible

9= Highly Susceptible

Cabbage Loopers	(a1.)		(c1.)		(c2.)	
Root Aphids	(a1.)		(c1.)		(c2.)	
Green Peach Aphid	(a1.)		(c1.)		(c2.)	
Lettuce Aphid	(a1.)	7	(c1.)	7	(c2.)	7
Pea Leafminer	(a1.)		(c1.)		(c2.)	
OTHER (Specify): _____	(a1.)		(c1.)		(c2.)	

14. PHYSIOLOGICAL STRESSES

1= Immune

3= Resistant

5= Moderately Resistant/Moderately Susceptible 7= Susceptible

9= Highly Susceptible

Tipburn	(a1.)		(c1.)		(c2.)	
Heat	(a1.)		(c1.)		(c2.)	
Drought	(a1.)		(c1.)		(c2.)	
Cold	(a1.)	5	(c1.)	5	(c2.)	3
Salt	(a1.)		(c1.)		(c2.)	
Brown Rib (Rib Discoloration, Rib Blight)	(a1.)		(c1.)		(c2.)	
OTHER (Specify): _____	(a1.)		(c1.)		(c2.)	

15. POSTHARVEST STRESS

1= Immune 3= Resistant 5= Moderately Resistant/Moderately Susceptible 7= Susceptible 9= Highly Susceptible

Pink Rib	(a1.)	<input type="checkbox"/>	(c1.)	<input type="checkbox"/>	(c2.)	<input type="checkbox"/>
Russet Spotting	(a1.)	<input type="checkbox"/>	(c1.)	<input type="checkbox"/>	(c2.)	<input type="checkbox"/>
Rusty Brown Discoloration	(a1.)	<input type="checkbox"/>	(c1.)	<input type="checkbox"/>	(c2.)	<input type="checkbox"/>
Internal Rib Necrosis (Blackheart, Grey Rib, Grey Streak)	(a1.)	<input type="checkbox"/>	(c1.)	<input type="checkbox"/>	(c2.)	<input type="checkbox"/>
Brown Stain	(a1.)	<input type="checkbox"/>	(c1.)	<input type="checkbox"/>	(c2.)	<input type="checkbox"/>

16. BIOCHEMICAL OR ELECTROPHORETIC MARKERS

17. COMMENTS

Suggested Check Varieties

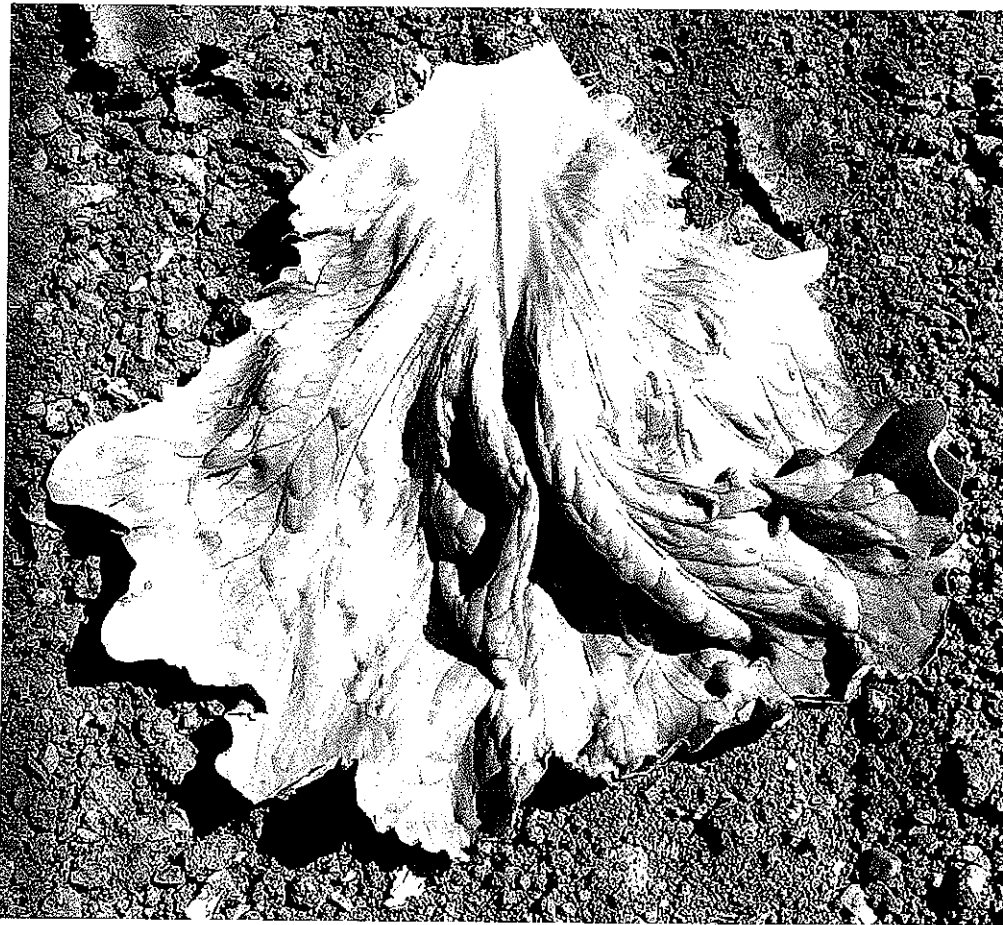
TYPE

CHECK VARIETY

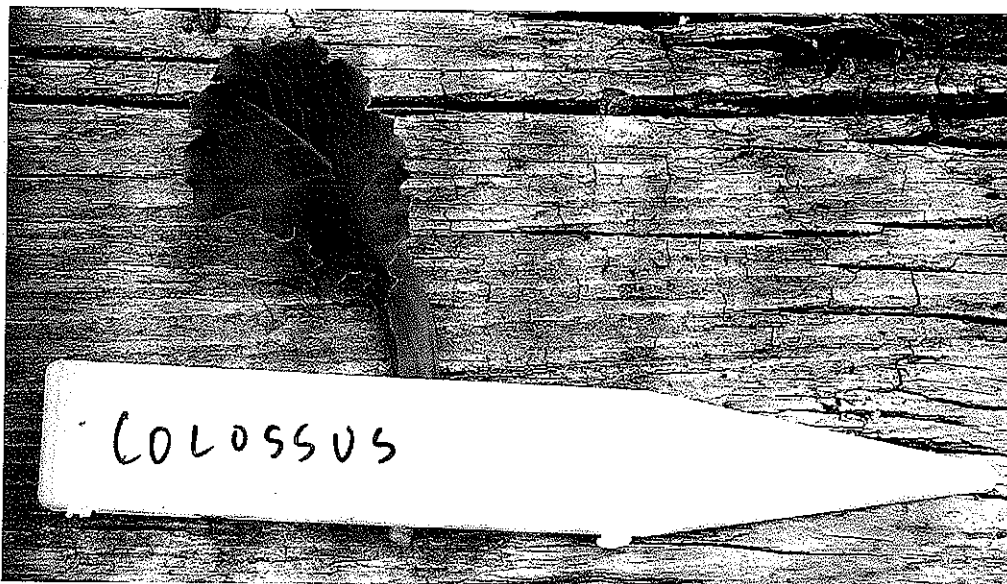
1	Cutting/Leaf	Waldmann's Green
2	Butterhead	Dark Green Boston
3	Bibb	Bibb
4	Cos or Romaine	Parris Island
5	Great Lakes Group	Great Lakes 659-700
6	Vanguard Group	Vanguard
7	Salinas Group	Salinas
8	Eastern Group	Ithaca
9	Stem	Celtuce
10	Latin	Little Gem

REFERENCES

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- Micheltmore, R. W., J. M. Norwood, D. S. Ingram, I. R. Crute and P. Nicholson. 1984. The inheritance of virulence in *Bremia lactucae* to match resistance factors 3, 4, 5, 6, 8, 9, 10 and 11 in lettuce (*Lactuca sativa*). Plant Pathology 32:176-177.
- Norwood, J. M., R. W. Micheltmore, I. R. Crute and D. S. Ingram. 1983. "The inheritance of specific virulence of *Bremia lactucae* (Downy mildew) to match R-factors 1, 2, 4, 6 and 11 in lettuce (*Lactuca sativa*)". Plant Pathology 32:176-177.
- Rodenburg, C.M., et al., 1960. "Varieties of Lettuce. An International Monograph," Instituut voor de Verdeling van Tuinbouwgewassen (IVT), Wageningen, NL
- Ryder, E.J., 1999. "Lettuce, Endive and Chicory". CABI Publications, Wallingford, UK



Colossus - Mature Leaf.jpg



Colossus - 4th Leaf.jpg

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE**EXHIBIT E**
STATEMENT OF THE BASIS OF OWNERSHIP

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). The information is held confidential until the certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) Shamrock Seed Company, Inc.	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER SSC 30376	3. VARIETY NAME Colossus
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) 3 Harris Place Salinas, CA 93901 USA	5. TELEPHONE (Include area code) (831) 771-1500	6. FAX (Include area code) (831) 771-1517
7. PVPO NUMBER		2004 00 011

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. If no, please explain.



YES



NO

9. Is the applicant (individual or company) a U.S. national or a U.S. based company? If no, give name of country.



YES



NO

10. Is the applicant the original owner?



YES



NO

If no, please answer one of the following:

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?



YES



NO

If no, give name of country

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?



YES



NO

If no, give name of country

11. Additional explanation on ownership (Trace ownership from original breeder to current owner. Use the reverse for extra space if needed):

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 0.1 hour per response, including the time for reviewing the instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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